

# Delivering the future today – the Floating Terminal *Princesse Chloe*

Transshipment facilities of 10 years ago have been surpassed in capacity and capabilities by a new floating terminal design

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The last decade has seen the evolution of various types of floating terminals. These have been deployed for various usages such as loading, discharging, lighterage, and so on. The most common ones, however, are used for offshore loading of dry bulk cargo – mainly coal.

Indonesia itself has witnessed the implementation of plethora of such transshipment facilities. The designs that were considered innovative in the last decade have now matured both in terms of capacity and capability. So the question arose – what now? This was indeed a challenge, which was accepted by PT Mitra Swire CTM, who has implemented a new futuristic Floating Terminal *Princesse Chloe*.

## Equipment and capability

*Princesse Chloe* has just been delivered from the Keppel Subic Shipyard and will commence operation soon after completing its trial runs off Muara Pantai, East Kalimantan in Indonesia. The system boasts a daily loading rate of 40,000 tons of coal, and an annual capacity exceeding 9.5 million tons. This is achieved by the combination of creativity and reliable technologies such as:

- Engineering done by Logmarin Advisors
- Cranes supplied by Liebherr, and
- Hoppers, conveyor system and ship loader supplied by Bedeschi.

The Floating Terminal is equipped with two heavy-duty, four-rope offshore Liebherr cranes of 30 tons capacity each. They have been fitted with Peiner Smag grabs of 20.5m<sup>3</sup> capacity, and are strategically placed in relation to the hoppers so as to minimize the slewing movement, thereby increasing the cycle time and efficiency. These heavy-duty cranes are specifically designed for offshore operations, which means they are more robust in construction and are able to perform even in adverse weather conditions. They are guaranteed to operate up to 2 meters of wave height and 25 knots wind speed.

## Cargo handling system

The cargo handling system supplied by Bedeschi consists of two duly designed hoppers, and an array of conveyor systems leading to a telescopic/shuttle ship-loader. The hoppers are of 50m<sup>3</sup> volume with a top opening sufficient to accommodate the footprint of the large grabs in use. The trunk-pyramidal shaped hoppers have asymmetrical walls to ensure smooth flow of coal through the hoppers into the transfer chute. The hoppers are fitted with vibrators to ensure free flow of sticky coal, in order to maintain the required flow rate. The tops of the hoppers are fitted with mesh grill to eliminate any oversize or undesirable material that may potentially damage or block the conveyor system.



The *Princesse Chloe* boasts a daily loading rate of 40,000 tons of coal, and an annual capacity exceeding 9.5 million tons.

In addition, hydraulically operated spill plates and a water sprinkler de-dusting system, both of which aim to minimize pollution. The spill plates are installed on the sea-side of the hoppers and are opened during cargo operations to cover the gap between the Floating Terminal and coal barge, thereby eliminating any chances of coal spillage. The water sprinkler system is installed on top of the hoppers to suppress the coal dust during grab delivery.

Coal from each of the hoppers is extracted by means of individual variable speed belt feeders. These frequency-controlled feeders extract coal from the hoppers and transfer it to the longitudinal conveyor. The belt width of the feeders is kept high and the speed is low to ensure uniform extraction of coal from the hoppers. Another conveyor then transports the coal longitudinally through the length of the Floating Terminal to the transfer point at a transverse conveyor. This helps in crossing over the entire beam of the terminal, leading to the final conveyor before being led to the ship-loader. The inclinations of all the conveyors have been designed in accordance to the grade of coal to be handled, in order to achieve smooth flow of cargo and avoid back-flow. Special care is taken in design of the transfer points to ensure no blockage occurs and the material flows smoothly. All the conveyors are enclosed to avoid airborne pollution.

The ship-loader is of shuttle/telescopic boom type and has a 19-meter air draft, making the *Princesse Chloe* capable of loading vessels large upto cape-size. The ship-loader is capable of swiveling by means of geared slewing rings, and luffing by means of hydraulic mechanisms. The shuttle length movement, in excess of 11 meters, gives the flexibility to deliver the cargo uniformly into the holds of the ocean-going vessels. A movable banana chute is fitted on the ship-loader's end to ensure delivery of coal into all areas of the ocean-going vessel's holds, which are normally not accessible by a straight chute. This is more important while loading cargoes with large stowage factors like coal, when it becomes important to fill in all the areas of the holds, thus avoiding dead freight charges.

Normally in a standard floating terminal belt shiploader type it is not possible to transfer a payloader to the ocean-going vessels to trim the holds. This is because the cranes are located on the other side of the barge and with their limited outreach it makes it impossible for them to deliver the payloaders into the ocean-going vessel's holds. Without the payloaders, it is not possible to achieve proper distribution and compaction of large stowage factor cargo in the cargo holds of ocean-going vessels, thereby resulting in short loading. Thanks to Logmarin and Bedeschi's innovation, a lifting winch has been incorporated on the delivery boom of the *Princesse Chloe*, which can easily transfer payloaders into the cargo holds, if required. This, both 'banana chute' and payloader lifting device allow best possible trimming will help in compaction of the coal in the holds of the vessels maximizing the vessel's transport capacity.

The cargo handling equipment designed by Logmarin and constructed and supplied by Bedeschi is manufactured with the highest classification for heavy-duty work for open sea conditions. The equipment has been designed for a heel and trim of 5° and 3° respectively.

The *Princesse Chloe* has been equipped with double independent Caterpillar electrical generator sets: one set for duty, while the other is on standby or maintenance to ensure 24 hours a day nonstop operations. This means a 100 percent redundancy on this critical service. An SGS automatic sampling device has been installed on the terminal to enable the shipper to take samples of cargo as delivered, into the ocean-going vessels' holds. It is also equipped with a belt scale to monitor the cargo quantity loaded, and a metal detection system to initiate an alarm if any metal is detected on the conveyor system.



*Princesse Chloe* will commence operation soon after completing trial runs off Muara Pantai, East Kalimantan, Indonesia.

The *Princesse Chloe* flies the Indonesian flag and complies with all the Indonesian laws and requirements. The system, including its hull and machinery, has been constructed and registered in accordance with the rules and regulations of RINA classification society and will operate in accordance with the ISPS and ISM code.

The cargo transfer takes place when the Floating Terminal is safely moored alongside the ocean-going vessel, with barges transporting the coal from the mine head alongside. The cranes transfer the coal from the barges into the hoppers, which then get transported through the conveyor system and the delivery ship-loader to the ocean-going vessels' holds. The process enables an average daily rate of 40,000 tons. The swelling capability of the ship-loader ensures serving multiple holds of the ocean-going vessels, without the need of shifting the *Princesse Chloe* alongside. The luffing mechanism of the ship-loader is used to cater the difference in the air draft of the ocean-going vessel at ballast to fully laden condition.

## The Floating Terminal and the environment

Protection of the environment is an integral part of the PT Mitra Swire CTM philosophy, with staff at sea and ashore prioritizing this notion within their duties. For this reason, the following devices have been built in to ensure environmentally friendly coal transshipment operations:

- Water spray system to minimize dust emission
- Spill plates to avoid coal spillage
- Fully enclosed conveyor system and coal transfer points to avoid wind pollution

- Sewage system to treat dirty water
- The diesel engine has been designed in accordance with the latest standards to reduce emission
- Rotating machinery mounted on vibration isolation pads to reduce noise and vibration.

## Bulk Logistic Landmark

The Floating Terminal *Princesse Chloe* implemented by PT Mitra Swire CTM, with the joint efforts of Logmarin, Liebherr and Bedeschi, is the culmination of years of experience in implementing numerous such solutions worldwide. Together Logmarin, Liebherr and Bedeschi have designed and implemented so many such systems that they have decided to pool in efforts to form an alliance called Bulk Logistics Landmark (BLL). BLL is a strategic business alliance profiting from the synergies of the three constituents. While continuing to do what each partner does, more efficiently, the pooling of skills and expertise of Bedeschi, Liebherr and Logmarin provides dependable, integrated, cost effective software and hardware, eco-friendly solutions in the dry bulk supply chain. BLL sums up significant resources in terms of expertise, technology, network and know-how from its partners and associates through years of experience.

From the initial similar projects implemented in the early part of the last decade, to the commissioning of the latest Floating Terminal *Princesse Chloe*, many improvements have taken place in this field with the aim to transship dry bulk cargo at a higher daily rate in a reliable and efficient manner. Each new BLL project incorporates the feedback received from the ongoing systems for continual design improvements. Creativity and reliable technology are necessary just as much as experience to ensure sound results suiting each specific end user situation. This is the added value of BLL.

### ABOUT THE COMPANY

**Logmarin** is a reputed Company specialized in Shipping Logistics with vast experience in several consultations and project feasibility studies worldwide for commodities such as coal, iron ore, Liquefied Natural Gas, and steel products, providing broad-based advice and experienced ideas so as to tailor-make innovative solutions for the specific needs of the clients suiting environmental and commercial issues at the site. Logmarin's scope of business is to provide an integrated and comprehensive consultation and advisory service, delivering value to the waterborne supply chain and industry. Logmarin individuals have about 20 years experience in the field, devising and designing different technologies for self unloading vessels, floating cranes, floating terminals, transshipper vessels, which operate in different environmental conditions world-wide.

### ENQUIRIES

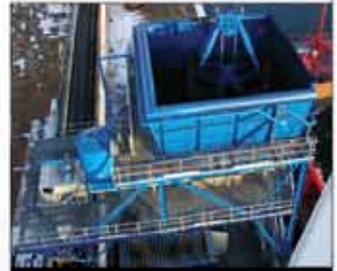
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